

CLAIMS:

1. A process for recovery of a valuable sulphide mineral comprising:
providing a slurry containing the valuable sulphide mineral and determining an Eh
range within which the mineral may be recovered by flotation without the need of a
5 collector,
and subjecting the slurry to flotation in a pneumatic cell at such a rate that the slurry
remains within the Eh range during flotation.
2. A process according to claim 1 wherein the slurry contains both a valuable sulphide
mineral and non-valuable sulphide mineral(s), the slurry being subjected to flotation in a
10 pneumatic cell at such a rate that flotation of the selected non-valuable mineral(s) is
reduced or eliminated.
3. A process according to claim 1 or 2 wherein flotation in the pneumatic flotation cell
is conducted at a neutral or slightly oxidising Eh.
4. A process according to any of the preceding claims wherein the Eh range is between
15 -100 mV and +200 mV.
5. A process according to any one of the preceding claims wherein the Eh range is
between -50mV and +100mV.
6. A process according to any one of the preceding claims wherein the residence time in
the pneumatic cell is below about two minutes,
- 20 7. A process according to any one of the preceding claims wherein the residence time in
the pneumatic cell is between one and two minutes.
8. A process according to any one of the preceding claims wherein the residence time in
the pneumatic cell is between one and 1.5 minutes.

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9. A process according to any one of the preceding claims wherein the slurry is conditioned such that it falls within the predetermined Eh range, prior to entry into the pneumatic cell.

10. A process according to any one of the previous claims wherein the rate of flotation is such that the normally required quantity of flotation additives and reagents to achieve the desired grade and recovery are not required.

11. A process according to any one of the preceding claims wherein the pneumatic flotation cell is selected from the group consisting of Jameson cell, EKOF cell, Bahr cell, contact cell, Multotec turbo-column or the like.

10 12. A process according to any one of the preceding claims wherein flotation is conducted in a near neutral and slightly alkaline environment.

13. A process according to any one of the preceding claims wherein the valuable sulphide mineral is chalcopyrite.

14. A process according to any of the preceding claims wherein the non-valuable sulphide mineral(s) includes pyrite.

15 15. A process according to any one of the preceding claims wherein the Eh range within which flotation occurs is that range within which the valuable sulphide mineral may be recovered by flotation without the need of a xanthate collector.

16. A process according to claim 13 wherein the mineral ore further includes chalcocite.

20 17. A process according to claim 14 wherein the chalcocite is also floated using a non-xanthate collector.

18. A method of improving recovery in a flotation circuit comprising adding as a scalper upstream of the flotation circuit, a pneumatic flotation cell wherein a slurry containing the valuable sulphide mineral is provided to the pneumatic cell and floated at such a rate that

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the slurry remains in an Eh range suitable for recovery by flotation without the need of a collector.

19. A method according to claim 18 wherein the rate of flotation is selected such that residence time in the pneumatic cell is below about two minutes.

Sub A 5 20. A method according to claim 18 or 19 wherein concentrate from the pneumatic flotation cell is sent to a final concentrate stream with the tailings from the pneumatic flotation cell being fed to the remainder of the flotation circuit.

Sub A 2 21. A process for recovery of a valuable sulphide mineral substantially as herein described with reference to any one of the examples or any one of the accompanying drawings.

10 22. A method of improving recovery in a flotation circuit substantially as herein described with reference to any one of the examples or any one of the accompanying drawings.

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